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BARRIERS TO TOTAL QUALITY MANAGEMENT (TQM) IMPLEMENTATION IN THE MAURITIAN FOOD INDUSTRY

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ABSTRACT

This study was undertaken to determine some of the barriers to the implementation of total quality management (TQM) in the population of medium to large Mauritian food manufacturing companies (MFMC), which were then compared with those identified in Indian and USA manufacturing industries. For this purpose, a questionnaire was sent to the population via e-mail. After carrying out exploratory factor analysis and reliability test, all constructs/investigated barriers were found to be valid and reliable. On comparing the mean ratings for the barriers, the local companies obtained the lowest mean rating that was significantly different ($p<0.05$) from Indian and USA manufacturing companies. This showed that these barriers had not yet impacted greatly in MFMC. However, the two potential obstacles identified in the Mauritian context were: *employee's resistance to change and frequent turnover of employees*.

Keywords: Food manufacturing industry, Total Quality Management, barriers.

1 INTRODUCTION

The facilitation of trade among countries by the World Trade Organization has enhanced competition in different industries. To attain an upper edge and improve competitiveness, many organizations have realized that meeting customer needs through the provision of quality products and services is a prime key to success. In response, many have adopted quality approaches like total quality management (TQM), which is an integrative management philosophy aimed at satisfying customers and improving continuously the processes. The adoption of TQM practices in many industries worldwide has indeed yielded positive benefits like major cost savings. Yet, many also argue that these results are not easy to achieve.

The implementation of quality programs in many companies has not always been proved to be beneficial. Numerous studies have actually shown that many firms are faced with other barriers that hinder also the development and implementation of TQM (Tamimi and Sebastianelli 1998, Mosadegh Rad 2005, Bhat and Rajashekhar 2009). According to Bhat and Rajashekhar (2009), these obstacles are not restricted to a particular sector but will show up in all sectors – manufacturing, services, government, and education. Therefore, it is important for all firms to understand and avoid these barriers both before and during the implementation of TQM (Tamimi and Sebastianelli 1998).

With regard to the food chain, TQM has been applied worldwide in the food supply and distribution industry. But according to Van Der Spiegel *et al*. (2005), TQM is less frequently used in the food manufacturing industries. Alsaleh (2007) also found that despite the advanced approaches of quality such as TQM play a critical role in improving the competitiveness of companies, the food companies surveyed in Saudi Arabia did not consider them to the extent that was needed. Such organizations might also find it difficult to implement TQM in a satisfactory and effective way due to some obstacles. Hence, the search for the barriers to TQM implementation has become a matter of utmost concern to management of each company worldwide since these barriers vary from one company to another.

Tamimi and Sebastianelli (1998) have identified 25 potential barriers to TQM success based on a review of the quality literature and personal interview with managers in different industries of USA. In 2003, these authors categorized some of these barriers into five main failure factors to TQM namely; inadequate human resources (HR) development and management, lack of leadership for quality, lack of planning for quality, inadequate resources for TQM and lack of customer focus. However, Talib *et al*. (2010) claimed that lack of customer focus is no longer a significant barrier in the current era of digital technology and mass customization since management is closely monitoring it through company-wide information network. Hence, this study will purport to determine whether the other four failure factors are relevant in the MFMC due to the fact that no such study has been undertaken before.

2 RESEARCH METHODOLOGY

2.1 Data collection tool and method

A total of 92 medium and large MFMC that has been recorded in the database available at Enterprise Mauritius and SMEDA in 2012 formed the population size of the study. Sebastianelli and Tamimi's (2003) questionnaire was adapted, and e-mailed together with a covering letter to the head of the quality department of those companies. Respondents were assured of that the information provided would be kept anonymous and confidential.

The questionnaire was structured into two sections. Section one covered the demographic profile of the companies while the other section consisted of four constructs representing the major barriers to TQM implementation. The constructs consisted of 20 statements (Table 2). Each statement was measured through the help of a subjective 5-point likert scale (1, not at all true; 2, slightly true; 3, somewhat true; 4, mostly true; 5, completely true) indicating how true each statement reflected the respondents' company. Of the 92 food companies, 40 quality professionals returned the filled questionnaire via e-mail, indicating a response rate of about 43.5%, which is acceptable for e-mail surveys.

2.2 Data analysis

Construct validity and reliability of the proposed constructs were first determined with the collected data. Construct validity was conducted via exploratory factor analysis (EFA) using principal component extraction with varimax rotation in the SPPS software to identify relevant statements underlying a construct. Statements that had a factor loading of at least 0.30 on their respective constructs were retained in this study because according to Hair *et al*. (2005), they are considered as significant. Next, the constructs were extracted based on the Eigen-value. Factors having Eigen-values greater than one were considered significant and retained while others were dropped (Hair *et al*. 2005). The reliability test was carried out using the internal consistency method, namely the Cronbach's α method. A computed alpha coefficient generated by the SPPS software of at least 0.70 for a construct is considered as acceptable (Hair *et al*. 2005).

Besides, statements for the TQM barriers that were retained after analysis for this study were compared with similar study carried out in the manufacturing sector of India (Bhat and Rajashekhar 2009) and USA (Sebastianelli and Tamimi 2003). Ranks were given to the statements in descending order of the mean ratings for each country, which were then compared. The overall mean ratings for each country were also compared using the least significant difference method.

3 RESULTS AND DISCUSSIONS

3.1 Background of companies

The participating companies, of which 55.0% were of medium size while the others large based on the annual sales turnover as defined by SMEDA (2010), covered well the population surveyed. The respondents were producers of different types of food products notably fish and seafood products (12.5%), beef and beef products (2.5%), poultry and poultry products (7.5%), vegetable and vegetable products (5.0%), fruit and fruit products (7.5%), alcoholic drinks (10.0%), milk and milk products (10.0%), soft drinks/ bottled water (10.0%), cereal and cereal products (7.5%), sweets and sugary

foods (2.5%), ice cream (5.0%), fats and oils (5.0%), spices (7.5%), peanuts (5.0%), and snacks (2.5%). In addition, 50% of the companies were certified to the ISO 9001:2008 standard while 42.9% were in process to the standard's certification. Moreover, 30% of the respondents have reported that the TQM concept has been implemented their company.

3.2 Validity and reliability of constructs

Table 1 indicates that each statement loaded significantly ($p<0.05$) on its respective construct since the factor loadings exceeded the value of 0.30, signalling high construct validity. Hence, all statements were retained for further analyses. Moreover, all the constructs maintained their original form after EFA because they had each an Eigen-value of more than one. The constructs had also satisfactory reliabilities since the Cronbach's alpha values surpassed the 0.70 threshold (Table 1) except the construct on 'lack of leadership (LL)' that yielded a value of 0.625 but this value was still acceptable since it was close to the threshold value.

3.3 TQM barriers in the local studied context and their comparison among countries

The mean ratings for each construct provided by the local respondents are provided in Table 1. The higher the mean, the more relevant is the barrier. Table 1 indicates that the participants gave an average agreement of slightly true (an approximate rating of 2) to each statement in each construct, indicating that the barriers investigated were not found to affect highly and negatively the implementation of TQM in the food companies under study. Among the studied barriers, the LL barrier scored the lowest mean rating (Table 1). Therefore, it can be pointed out that the top management (TM) of those companies was generally committed to the quality concept and it can be argued that this TQM barrier is far less than a barrier and more than a success factor in the implementation of TQM in the local context.

Table 1: Rotated factor matrix of the TQM barriers after EFA.

TQM barrier	Factor loading significant at 0.01 level for statement number							Mean	Standard error	Eigen value	Cronbach's α-value
	1	2	3	4	5	6	7				
IHRDM	0.826	0.875	0.772	0.771	0.686			2.04	0.142	3.031	0.830
LL	0.568	0.660	0.758	0.820				1.48	0.112	2.118	0.625
LSQP	0.812	0.704	0.642	0.754	0.508	0.742	0.530	1.80	0.120	3.290	0.788
IR	0.681	0.831	0.808	0.616				2.22	0.133	2.196	0.718
Overall								1.88	0.161		0.893

Moreover, the LL barrier correlated highly and positively with the other barriers (Figure 1). Hence, it can be suggested that the LL barrier is the driver of the other three barriers. A close analysis revealed that if the main driver of successful implementation of TQM, that is, leadership including TM commitment to quality, as considered by many studies (e.g. Demirbag *et al*. 2006), is present properly, then the existence of the three barriers namely IHRDM, LSQP and IR holds minimally. This can be explained by the fact the allocation of resources for areas like quality improvement activities and for employee systematic quality training, which enhances the way employees tackle a quality task/problem, is influenced by TM. Moreover, TM is directly responsible for determining an appropriate organization culture, vision, and quality policy through strategic quality planning (Demirbag *et al*. 2006). Juran (1986) reported that some managers gave SQP a low priority since they are either unable or not willing to plan effectively for quality improvement. However, this present study showed that managers of the responding companies in general practised SQP due to its low mean rating (Table 2).

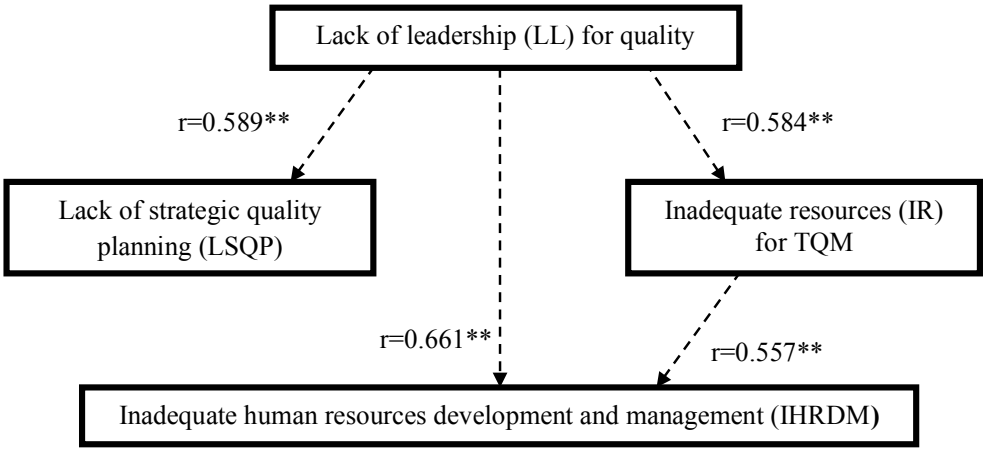

Figure 1: Relationship among TQM barriers investigated in the Mauritian food companies (n=40); correlation significant at *p<0.05, **p<0.01.

Ranking the mean of each statement in descending order for the three countries indicated that some statements yielded almost the same rank throughout the three countries like L1, S3, S4 and H1 while for some statements, almost the same rank appeared in two of the three countries like S1, S7, R1 and R2 (Table 2). An attempt was made to carry out this comparison due to the fact that the current study dealt with companies only in the manufacturing sector and that conducted by Bhat and Rajashekhar (2009) and by Sebastianelli and Tamimi (2003) focused on 80% and 66% of Indian and USA companies in the manufacturing sector respectively. Hence, an almost similar demographic profile of the respondents, in terms of sector, among the countries enabled the comparison of the mean ratings for similar statements. On comparing the overall mean ratings for the TQM barriers (Table 2) among the three countries, the rating for Mauritius was the lowest and was statistically different ($p<0.05$) from the other countries. Hence, these barriers had a less impact on the Mauritian companies surveyed as compared to the Indian and USA firms.

Considering the ranks of the individual statements for Mauritius (Table 2), it was found that the statements namely "*employees are resistant to change*" and "*there is frequent turnover of employees*" had the highest mean ratings of 2.75 and 2.50 respectively. The Indian firms had a similar problem of employees' resistance (Table 2). According to Mosadegh Rad (2005), many employees are resistant to TQM because they believe that TQM requires them to work harder for fewer rewards. Moreover, it has been reported in many studies like Mosadegh Rad (2005) that compensation is not always linked to the achievement of quality goals, which explains why many employees are not willing to adopt the new culture that TQM is offering. This explanation could hold true for the current study since most respondents agreed somewhat to the statement (a mean rating of 2.30) that "*management's compensation is not linked to achieving quality goals*" and they were thus most probably somewhat resistant to change. However, this monetary obstacle to TQM implementation held the first position in USA firms (Table 2). Lack of benchmarking also ranked among the first ones in USA and India too (Table 2). According to Bhat and Rajashekhar (2009), industries should understand that benchmarking is a tool used to identify their strengths and weaknesses compared to the best in their class. As for the frequent turnover of employees prevailing among the local surveyed companies, a lack of training, lack of a reward system, ineffective employee selection process, ineffective employee compensation and lack of promotion could be some of the causes (Jun *et al*. 2004, Mosadegh Rad 2005).

Table 2: Comparison of importance of barriers to TQM as perceived by Mauritian food manufacturing firms, Indian and US firms

Statement		Mauritian food manufacturing firms			Indian firms (Sebastianelli and Tamimi 2003)		US firms (Bhat and Rajashekha, 2009)	
		Mean	SE	Rank	Mean	Rank	Mean	Rank
H1	Employees are not trained in problem identification and problems solving techniques.	2.18	0.189	4	2.75	5	3.08	4
H2	Employees are not trained in quality improvement skills.	1.85	0.181	10	2.68	6	3.11	3
H3	Employees are not empowered to implement quality improvement efforts.	1.70	0.169	14	2.30	18	2.86	8
H4	Teams involving all departments are not employed.	1.95	0.182	9	2.51	11	2.27	19
H5	There is frequent turnover of employees.	2.50	0.196	2	2.25	19	2.30	17
L1	Quality is not everyone's responsibility.	1.60	0.192	16	2.31	17	2.28	18
L2	Top management is not committed to quality.	1.20	0.114	20	2.34	15	2.66	10
L3	Quality is treated as a separate initiative.	1.35	0.137	19	2.67	7	2.72	9
L4	There are excess layers of management.	1.75	0.195	11	2.65	8	1.93	20
S1	The best practices and/or products of other companies are not benchmarked.	2.15	0.219	5	3.00	1	3.16	2
S2	Strategic plans do not include quality goals.	1.50	0.156	18	2.55	10	2.40	16
S3	There is no joint planning with suppliers.	1.73	0.160	13	2.48	12	2.61	14
S4	The strategic plan is not customer driven.	1.63	0.185	15	2.37	14	2.63	13
S5	Quality action plans are often vague.	1.53	0.124	17	2.14	20	2.66	10
S6	Quality is not effectively measured.	1.74	0.171	12	2.80	4	2.46	15
S7	Management's compensation is not linked to achieving quality goals.	2.30	0.233	3	2.42	13	3.89	1
R1	Time constraints prohibit effective TQM implementation.	2.03	0.154	7	2.58	9	2.91	6
R2	There are inadequate resources to employ TQM.	2.10	0.182	6	2.82	3	2.95	7
R3	Employees are resistant to change.	2.75	0.217	1	2.92	2	3.02	5
R4	The high costs of implementing TQM outweigh the benefits.	2.00	0.164	8	2.34	15	2.66	10
	Overall mean ratings (ratings with different superscripted letter are significantly different at 5% level)	1.88b			2.54a		2.73a	

4 CONCLUSIONS

Overall, the TQM barriers investigated namely lack of leadership (LL), inadequate human resources development and management (IHRDM), lack of strategic quality planning (LSQP) and inadequate resources (IR) had little relevance in the Mauritian food companies under study as compared to Indian and USA manufacturing firms. This could be because the local companies have adopted generally good practices of TQM. Despite the fact that very few companies have adopted the TQM philosophy in the local food companies surveyed, this study showed that the four proposed barriers to

TQM implementation were not potential barriers in the local context in general. Hence, the local food companies that have not yet implemented TQM seemed to be somewhat ready to start the implementation of the philosophy. As for the statements with highest mean ratings like *employee's resistance to change* and *frequent turnover of employees,* the companies can still try to improve on them.

This study offers a number of implications for managers of medium to large food companies locally. Companies currently implementing TQM, or planning to implement TQM, will pay attention to the barriers for successful implementation of a TQM program. For instance, employees' resistance to TQM implementation can be changed by making them feel that quality helps improve productivity, reduce costs and as Mosadegh Rad (2005) stated, they are directly or indirectly responsible for customer satisfaction. Moreover, according to Jun *et al.* (2004), appraisal schemes such as family finances, basic healthcare facilities, quality and punctuality bonuses can help reduce turnover of employees. Managers should also understand that those barriers vary to different extents in different companies. Hence, managers should understand them well and deal with them accordingly to enable successful TQM implementation. Besides, ranking the different obstacles to TQM implementation can be more useful to develop strategies to improve the success of TQM implementation.

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